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AMSAT NEWS SERVICE
ANS-053

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

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SB SAT @ AMSAT $ANS-053.01
ANS-053 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 053.01
>From AMSAT HQ KENSINGTON, MD.
DATE February 22, 2015
To All RADIO AMATEURS
BID: $ANS-053.01

## ARISS School Proposal Window for the United States is now Open

February 17, 2015 - ARISS is now accepting proposals for U.S. schools wishing to schedule contacts between their students and the International Space Station for the next cycle. Details on submitting proposals can be found below in the attached ARRL News Release.

Message to US Educators

Amateur Radio on the International Space Station

Contact Opportunity

Call for Proposals
Proposal Window February 15 - April 15, 2015

The Amateur Radio on the International Space Station (ARISS) Program is seeking formal and informal education institutions and organizations, individually or working together, to host an Amateur Radio contact with a crew member on board the ISS. ARISS anticipates that the contact would be held between *January 1, 2016 and June 30, 2016*. Crew scheduling and ISS orbits will determine the exact contact dates. To maximize these radio contact opportunities, ARISS is looking for organizations that will draw large numbers of participants and integrate the contact into a well-developed education plan.

The deadline to submit a proposal is April 15, 2015. Proposal information and documents can be found at www.arrl.org/hosting-an-ariss-contact.

The Opportunity

Crew members aboard the International Space Station will participate in scheduled Amateur Radio contacts. These radio contacts are approximately 10 minutes in length and allow students and educators to interact with the astronauts through a question-and-answer session.

An ARISS contact is a voice-only communication opportunity via Amateur Radio between astronauts and cosmonauts aboard the space station and classrooms and communities. ARISS contacts afford education audiences the opportunity to learn firsthand from astronauts what it is like to live and work in space and to learn about space research conducted on the ISS. Students also will have an opportunity to learn about satellite communication, wireless technology, and radio science. Because of the nature of human spaceflight and the complexity of scheduling activities aboard the ISS, organizations must demonstrate flexibility to accommodate changes in contact dates and times.

Amateur Radio organizations around the world, NASA, and space agencies in Russia, Canada, Japan and Europe sponsor this educational opportunity by providing the equipment and operational support to enable direct communication between crew on the ISS and students around the world via Amateur Radio. In the US, the program is managed by AMSAT (Radio Amateur Satellite Corporation) and ARRL (American Radio Relay League) in partnership with NASA.

More Information

Interested parties can find more information about the program at www.ariss.org and www.arrl.org/ARISS.

For proposal information and more details such as expectations, proposal guidelines and proposal form, and dates and times of Information Sessions go to www.arrl.org/hosting-an-ariss-contact. Please direct any questions to ariss(a)arrl.org.

[ANS thanks ARISS for the above information]

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Amateur radios on ISS to be off in support of upcoming spacewalks

Astronauts Wilmore, Virts and Cristoforetti will be performing three spacewalks over the next few weeks and will impact some of the amateur radio operations on the International Space Station (ISS). Spacewalks have been scheduled for February 21, 24 and March 1 and

will have the amateur radios turned off to assure the safety of the crewmembers working outside of the ISS. The first spacewalk is now set to begin Saturday at 7:10 a.m. EST with NASA TV live coverage starting at 6 a.m. The second and third spacewalks are planned for Feb. 25 and March 1, both beginning at 7:10 a.m.

The announcement can be reviewed:
http://tinyurl.com/ANS053-EVA-Schedule

The series of spacewalks will prepare cables and communications gear for new docking ports that will allow future crews launched from Florida on U.S. commercial spacecraft to dock to the space station. The spacewalks will be the 185th, 186th and 187th in support of space station assembly and maintenance.

There is always a possibility that the schedule for the EVAs could change. The amateur radios will be turned off to accommodate any adjustments to the EVA schedule.

[ANS thanks NASA, Kenneth - N5VHO for the above information]

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SSTV Activity from the ISS is scheduled February 22-23 - Update

Continuous SSTV transmission was planned from Saturday 21 February at about 10.00 UTC till Monday 23  February 21.30 UTC.

Due to onboard activities, the transmission is differed.
It will *possibly* take place beginning Sunday February 22 after 10:00 UTC and end Monday February 23 at the crew's sleep time.

It is expected that 12 different photos will be sent on 145.800 MHz FM, using the SSTV mode PD180, with 3 minutes off periods between transmissions.

One of the photos will show the commemorative diploma created by PZK, the national Polish Amateur Radio society, on the occasion of the 80th anniversary of the birth of first cosmonaut J.A.Gagarine. More about this diploma in due time.

The equipment used will be the Kenwood D710 transceiver located in the Russian Service Module.

The pictures to be downlinked will be Series 1 images allowing the world-wide community of hams and schools to receive previously sent pictures, but replacing one with new additional image added specially for this event.

The transmit frequency will be 145.800 MHz.

Received images can be uploaded to the ARISS Image gallery found at http://www.spaceflightsoftware.com/ARISS_SSTV/index.php

The ARISS team is developing plans for transmitting new images to space enthusiasts around the world in upcoming months.

*Editor's note: Adjustments to the the proposed EVAs mentioned in the previous story could have an impact on the above schedule.

[ANS thanks Gaston, ON4WF, for the above information]

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Astronaut Ham Renews License, Plus Four New Astronaut Hams

Michael Fincke, KE5AIT recently renewed his Amateur Radio license through February 18, 2025. Fincke served on Expedition 9 (April 18 to October 23, 2004), Expedition 18 (October 12, 2008 to April 8, 2009), and STS-134 (May 16 to June 1, 2011). He currently holds the American record for the most time in space, 381.6 days.

Fincke's biography can be viewed at:
http://www.jsc.nasa.gov/Bios/htmlbios/fincke.html

Four astronauts recently passed their Technician Class license exams.

Thomas Pesquet, KG5FYG
Jack Fischer, KG5FYH
David Saint-Jacques, KG5FYI
Kathleen Rubins, PHD., KG5FYJ

Pesquet was selected as an ESA astronaut in May 2009. He joined ESA in September 2009 and completed basic training in November 2010. He will be leaving our planet for six months November 2016 as a flight engineer for Expeditions 50 and 51, returning in May 2017.

Pesquet's biography can be viewed at:
http://tinyurl.com/ANS053-Thomas-Pesquet-Bio

Fischer was selected in July 2009 as a member of the 20th NASA astronaut class. He completed astronaut candidate training in July 2011.

Fischer's biography can be viewed at:
http://www.jsc.nasa.gov/Bios/htmlbios/fischer-jack.html

Saint-Jacques was selected in May 2009 by the Canadian Space Agency (CSA) and has moved to Houston to be one of 14 members of the 20th NASA astronaut class.

Saint-Jacques' biography can be viewed at:
http://www.asc-csa.gc.ca/eng/astronauts/biosaintjacques.asp

Dr. Rubins was selected in July 2009 as 1 of 14 members of NASA Astronaut Group 20. She has been selected as flight engineer-2 for ISS Expedition 48/49 launching on Soyuz TMA-20M in May 2016

Dr. Rubins' biography can be viewed at:
http://www.jsc.nasa.gov/Bios/htmlbios/rubins-k.html

[ANS thanks Kenneth N5VHO, NASA, ESA and CSA for the above information]

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John Grunsfeld, KC5ZTF, named to Astronaut Hall of Fame

Astronaut and Amateur Radio operator John Grunsfeld, KC5ZTF, will be installed into the Astronaut Hall of Fame in May of 2015, along with Rhea Seddon, Steven Lindsey, and Kent Rominger. They join the likes of previous inductees including Alan Shepard, Neil Armstrong, and

John Young in a ceremony on May 30 at Kennedy Space Center's Visitor Complex (KSCVC).

Each year the selection process is managed by the Foundation, and inductees are selected from a pool of nominations, with the finalists selected by a panel of Hall of Fame astronauts, NASA leaders, flight directors, historians and journalists.

According to Collect Space, "To be eligible, astronauts must be U.S citizens and have made their first spaceflight at least 17 years prior to their induction year. In addition, nominees need to be a NASA-trained commander, pilot or mission specialist who orbited the Earth at least once."

The 2015 inductees are the 14th class, and combined the group has flown a total of 18 shuttle missions over 26 years. With the addition of this year's inductees, the total number of astronauts admitted to the Hall of Fame will be 91.

John Grunsfeld, KC5ZTF, current NASA associate administrator for science, is a veteran of five spaceflights, and logged over 58 days in space with 60 hours of EVA time spread over eight different spacewalks.

First flying in 1995 as part of STS-67, a dedicated astronomy mission, Grunsfeld served as a mission specialist. Launching from Kennedy Space Center aboard the Space Shuttle Endeavour, STS-67 was the second on three flights for the Astro 2 observatory -- an ultraviolet telescope.  During this record-setting 16-day mission, the crew conducted 'round the clock observations of faint astronomical objects as well as the polarization of UV light from distant galaxies.

His second flight, STS-81 was the fifth shuttle flight to dock with the Mir space station. Launching aboard the Space Shuttle Atlantis, Grunsfeld served as a flight engineer during this ten day mission.

His next three flights, STS-103, STS-109, STS-125 would be servicing missions to the Hubble Space Telescope (HST). Over the course of these three mission, and several spacewalks, Grunsfeld helped upgrade and install new cameras, such as the wide-field camera on the telescope, ensuring it would be functional for years to come. His final flight was also the final flight to Hubble.

During his last spacewalk, Grunsfeld said this about the mission, "We've been on a tremendous adventure, and been a part of a challenging mission. Hubble isn't just another satellite, it's humanity's quest for knowledge."

When asked about his experience as an astronaut and what it felt like to be nominated, Grunsfeld said, "The biggest honor is to be an astronaut. It is such a tremendous privilege to be able to represent humankind in our efforts to explore space."

[ANS thanks Spaceflight Insider for the above information]

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JPL Plans 2401 MHz Lunar Ranging Experiment March 3

NASA Jet Propulsion Lab (JPL) will transmit a narrow band signal at about 2041 MHz illuminating a spot on the moon (probably centered on

Tycho) about 1000km in diameter early in the morning of 3 March between about 0630 to 0900 UTC.

JPL will be transmitting about 20kW from a 34 m aperture. They are planning to have three distinct transmission modes, two will be a CW carrier, and a third mode including a PN ranging code on the signal, probably changing every 45 minutes.

The signal should be easy to detect with even a small receive antenna (at least the narrow band signal).

If you have a wideband recorder, the ranging code should be easy to recover with post processing. Standard ranging code as defined in 810-005

http://deepspace.jpl.nasa.gov/dsndocs/810-005/214/214-1.pdf

As with all PN ranging done by the Deep Space Network, the PN code rate is coherent to the transmit carrier, probably 1.9931640625 MHz (or half that) in this case.

The current status of the NASA Deep Space Network is displayed online at:
http://eyes.nasa.gov/dsn/dsn.html

[ANS thanks Jim Lux via amateur-DSN(a)yahoogroups.com for the above information]

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New Educational Materials Available at NASA.gov

Are you looking for a lesson plan that combines mathematics and space science? Do you need a set of images of objects in our solar system? Or maybe you're hunting for hands-on engineering projects to challenge your students. NASA Education has you covered!

The following items are now available for downloading.

NASA Education Brochure -- All Educators
NASA Education has a vision to advance science, technology, engineering and mathematics education using NASA's unique capabilities. This brochure explains the four initiatives for achieving that vision. Learn how you can get involved.
http://tinyurl.com/ANS053-NASA-Education-Brochure

Space Math VIII Educator Guide - Grades 5-12
Students apply problem-solving, algebra, geometry or trigonometry skills to a selection of 49 real-world problems involving Earth and space science. Each word problem includes background information. One-page teachers' answer keys accompany the one-page assignments.
http://tinyurl.com/ANS053-Space-Math

Space Math IX Educator Guide -- Grades 5-12
This collection of activities is intended for students looking for additional challenges in the mathematics and physical science curriculum.
The subjects of the problems include spacecraft, rovers and meteorites. Mathematical topics include algebra, geometry and calculus. Each word problem has background information. One-page teachers' answer keys accompany the one-page assignments.
http://tinyurl.com/ANS053-Space-Math-IX

Our Solar System Lithograph Set -- All Grade Levels
This lithograph set features images of the planets, sun, asteroids, comets, meteors and meteorites, the Kuiper Belt and Oort Cloud, and moons of the solar system. General information, significant dates, interesting facts and brief descriptions of the images are included.
http://tinyurl.com/ANS053-Solar-System-Lithograph

NASA's BEST Next Generation Activity Guide - Technology Demonstration Missions - Grades 5-8
This activity guide includes nine hands-on engineering projects focusing on the engineering design process and real-world science, technology and mathematics.
http://tinyurl.com/ANS053-Tech-Demo

Year of the Solar System -- Real World Math -- Grades 6-12
This collection of activities allows students to use mathematical concepts from fractions to calculus as they learn about asteroids, comets, planets, craters, planetary rings and many more space science topics.
http://tinyurl.com/ANS053-Real-World-Math

Looking for more?
NASA's new Educational Resource Search Tool can help you find lesson plans, posters, educator guides and other materials to supplement your science, technology, engineering and mathematics curriculum. Search hundreds of resources by subject, grade level, type and keywords.

To check out the new search tool and begin your educational resource hunt, visit http://www.nasa.gov/education/materials/

[ANS thanks NASA Education Express Message -- Feb. 19, 2015 for the above information]

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Design The Next AMSAT Satellite!

At the 2014 AMSAT Space Symposium AMSAT Vice President - Engineering Jerry Buxton announced the plan for the next generation of AMSAT satellites. "The door is open for everyone, to submit their ideas. AMSAT Engineering has a long term strategy and this is the first step."

The Engineering long term strategy includes the following goals

* Advancement of amateur radio satellite technical and communications skills
* Enhance international goodwill
* Grow and sustain a skilled pool of amateur radio satellite engineers
* Establish and maintain partnerships with educational institutions
* Develop a means to use hardware common to all opportunities

With respect to the last goal Jerry said "Within the bounds of the type of satellite it takes to achieve any of the various orbit opportunities, let's consider in those plans the possibility of developing a platform that can suit any and all orbits. Perhaps a modular CubeSat, using a common bus as we did in Fox-1, which gives great flexibility in building and flying different sizes and configurations of CubeSats with simple common-design hardware changes."

Submissions should be thorough and contain the following information. The purpose of the proposal is not just in suggesting an idea; being an all-volunteer team AMSAT needs your help in carrying out the idea.

Design
Implementation - CubeSat platform
Estimated timeline
Cost - volunteer resources, commercial (COTS) units
Launch - how does it get to orbit
Strategy - how it fits into AMSAT's Engineering long term strategy
As mentioned above the idea should be based on the CubeSat platform. This is the standard through which we will look for launches in the foreseeable future.

In considering your proposal, Jerry encourages you to contact him, (n0jy(a)amsat.org using Subject: Design the Next AMSAT Satelleite), for more details on the criteria.

A guidebook to the criteria is now available for download at

http://tinyurl.com/ANS032-SatelliteGuide.

In particular, if you plan to include a university as a partner to provide experiments or other support and you are not representing that university, please contact Jerry for assistance in working with our existing partners or establishing a new partnership.

"Being amateur radio operators, it is easy for us to fall into a particular trap because of our history of communicating with other amateurs throughout the world" says Jerry. "Specifically, most people who are not already involved in the world of satellite technology are unaware of or simply overlook the provisions of the current ITAR and soon to be EAR export rules particularly with regard to deemed exports which requires governmental permission to discuss satellite projects with foreign nationals."

While all amateurs are invited to submit ideas, U.S. amateurs must take particular care of they choose to become involved in a collaboration which includes individuals from other countries. It is permissible to receive ideas and proposals from outside the U.S., but it is not permitted for U.S. Persons to export or share design ideas with other countries unless they have taken the proper steps to insure compliance with ITAR and deemed export rules.

Additionally, those wishing to work on proposals should use care in presenting themselves in their contacts. While the goal is for AMSAT to build and launch the satellite, it is not an AMSAT project until it is accepted by the AMSAT Board of Directors. It is acceptable to represent yourself as members of a project team that plans to submit a proposal to AMSAT for a future satellite project, as the AMSAT name is well known.

"It is not our intention that ideas be submitted to AMSAT-NA which would be more appropriately handled by an AMSAT organization in a country where AMSAT is established. AMSAT-NA is seeking ideas from amateurs in North America and will certainly consider ideas from amateurs in countries which do not have an established AMSAT organization or relationships with an existing AMSAT organization."

The deadline for submissions is May 30, 2015. After the submission date the ideas will be screened for completeness and then reviewed by a board consisting of the AMSAT Engineering Team, AMSAT Senior

Officer and Board of Directors representatives, and aerospace industry members. The review board may modify or consolidate ideas and will consider which meet the criteria to become a project based on feasibility, cost, and the ability to bring value to the amateur satellite community. The review process is expected to be completed in September 2015.

For those ideas selected to become a project which satisfy the requirements for an ELaNa launch, the idea authors will be asked to work with the AMSAT Engineering Team on an ELaNa proposal.

The Engineering Team will then work on the details of execution for the selected project(s) and present a proposal to the AMSAT Board of Directors in October 2015 for final approval to begin work. Once approved, any ELaNa proposals will be submitted in November 2015 and the project(s) will move forward.

Now is the time for YOU to begin working on the next AMSAT satellite!

[ANS thanks AMSAT Engineering for the above information]

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ARISS News

+ A Successful contact was made between Scuola Secondaria di Primo Grado "Bachelet", Cernusco sul naviglio, Italy and Astronaut Samantha Cristoforetti IZØUDF using callsign NA1SS. The contact began 2015-02-05 10:37 UTC and lasted about nine and a half minutes. Contact was telebridged via W6SRJ. ARISS Mentor was IZ2GOJ.

+ A Successful contact was made between Scuola Media Locatelli-Oriani, Milano, Italy and Astronaut Samantha Cristoforetti IZØUDF using callsign NA1SS. The contact began 2015-02-05 10:37 UTC and lasted about nine and a half minutes. Contact was telebridged via W6SRJ. ARISS Mentor was IZ2GOJ.

+ A Successful contact was made between W.T. Sampson (DoD school), Guantanamo Bay, Cuba and Astronaut Samantha Cristoforetti IZØUDF using callsign IR0ISS. The contact began 2015-02-11 15:58 UTC and lasted about nine and a half minutes. Contact was telebridged via IK1SLD. ARISS Mentor was AA4KN.

+ A Successful contact was made between Council Rock High School-South, Holland, PA and Astronaut Samantha Cristoforetti IZØUDF using Callsign NA1SS. The contact began 2015-02-19 18:18:27 UTC and lasted about nine and a half minutes. Contact was direct via K3DN.
ARISS Mentor was KB9UPS.

Upcoming ARISS Contact Schedule

An ARISS contact is planned with Riversink Elementary School, Crawfordville, FL. The contact will be direct via K4WAK The ISS callsign is presently scheduled to be NA1SS The scheduled astronaut is Samantha Cristoforetti IZØUDF
Contact is scheduled for: Wed 2015-02-25 16:09:15 UTC

The contact should be audible over the eastern U.S and adjacent areas. Interested parties are invited to listen in on the 145.80 MHz downlink. The contact is expected to be conducted in English.

Riversink Elementary School is a K-5 public school operating within

the Wakulla County School District. It is a Title I school located in rural Crawfordville, Florida. Riversink first opened its doors in August of 2008. Teachers at Riversink believe that every student will reach his or her highest potential in a positive learning environment that encourages students to be respectful, responsible, and ready to learn. Students at Riversink are highly successful due, in part, to the collaborative efforts of the faculty and staff, along with strong parental support. The student body is made up of 470 students. The school has 37 teachers. Riversink's mission is to facilitate the development of all students to their fullest potential by providing research-based instructional strategies and promoting a love of learning and community pride in a safe, positive environment.

A team of science and technology students and their teachers from Council Rock South High School, Richboro, PA will be speaking directly with astronauts on the International Space Station (ISS) as it flies over the Philadelphia area. A group of experienced operators from the Warminster Amateur Radio Club will be at the school to assist the teachers and students as they use Ham Radio technology to make the contact.

The school will be using a recently donated radio system and antennas to participate in the ARISS program (Amateur Radio on the International Space Station) in which students talk directly with the astronauts and ask questions about living in space while the astronauts are actually there.

Science teachers Jerry Fetter and Jeff Warmkessel have been with NASA's NEAT program (Network of Educator-Astronaut Teachers) since 2004 and got the idea of applying to the ARISS program when Fetter's Astronomy classes were talking about living in space. "They kept asking questions which only astronauts would know how to answers", said Fetter. "I remember thinking how great it would be if we could just ask them directly. To be able to ask the astronauts while they fly overhead is beyond my wildest plans!"

Students in various STEM (Science, Technology, Engineering and Math) programs at Council Rock South High School have spent time considering which questions are important enough to ask an astronaut in the short amount of time available (approximately 12 minutes) as the ISS's flight path crosses over the area.

Participants will ask as many of the following questions as time allows:

1. Dominic (5): When you come back to Earth after being on the ISS, are you able to walk or does it take time to get used to it?
2. Kyle (4): Are there laws in space?
3. Amelia (3): Other than floating, how is living in space different than living on the earth?
4. Brooks (2): How far have you traveled around the earth?
5. Makayla (1): How do you get to be an astronaut?
6. Jabari (K): What can you do in your free time on the space station?
7. Addison (K): How do you sleep in space?
8. Hannah (1): How long does it take to get to the ISS?
9. Chace (2): How do you power the ISS?
10. Payton (3): Has the space station ever been hit or almost hit by anything?
11. Jasmine (4): What happens if you get sick in space?
12. Harley (5): When you sweat on the space station, does it stick to your body or does it float away?
13. Dominic (5): What has been the most memorable moment you've had

as an astronaut?
14. Kyle (4): What time zone do you use in space?
15. Amelia (3): What kind of work are you doing on the space station?
16. Brooks (2): What is it like to exercise on the space station?
17. Makayla (1): How do you eat in space?
18. Jabari (K) How does the space station move?
19. Addison (K): What do you miss the most about being on Earth?
20. Hannah (1): What belongings can you take with you to the space station?
21. Chace (2): What kinds of experiments are you working on?
22. Payton (3): When you grow plants in space, how do you water them?
23. Jasmine (4): How do you communicate with your family?
24. Harley (5): How does it feel to be the first Italian woman in space?

[ANS thanks ARISS, Charlie AJ9N and David AA4KN for the above information]

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Satellite Shorts From All Over

+ Hams in Space

  Since the earliest days of the Space Shuttle, many astronauts have become licensed radio amateurs to communicate to stations on earth while traveling in space and on the International Space Station.

  For a list of astronauts who hold or have held an amateur radio license visit
  http://www.ariss.org/hams-in-space.html

+ The January/February 2015 AMSAT Journal has been mailed. Look for your copy if you haven't already received it.

+ Dayton will host the 2015 AMSAT Space Symposium October 16-18 at the Crowne Plaza in downtown Dayton. More information will be posted on the AMSAT website www.amsat.org as it becomes available.

+ A great Russian 435-438 MHz WebSDR with labels for satellite frequencies is now available on line at: http://websdr.r4uab.ru/

+ Need a 2015 calendar? How about one with out-of-this-world images? Download the ?#?ISS calendar here:

  http://tinyurl.com/ANS053-Calendar

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the stu-

dent rate for a maximum of 6 post-secondary years in this status.
Contact Martha at the AMSAT Office for additional student membership
information.

73,
This week's ANS Editor,
EMike McCardel, KC8YLD
kc8yld at amsat dot org